1861MNRAS..22R...6H

Total Solar Eclipse, 1861, *Dec.* 31.

By J. R. Hind, Esq.

The following Table, exhibiting the path of the Moon's shadow over the African continent, in the eclipse of 1861, Dec. 31, has been derived from accurate calculations founded upon the Tables of Le Verrier and Hansen, assuming the diameters of Sun and Moon as there adopted:—

Greenwich Mean Time.	N. Limit.		Central Line.		S. Limit.		Duration of Totality on Central Line.
	Long.	Lat.	Long.	Lat.	Long.	Lat.	
h m	° ′	° ′	° ′	° ′	° ′	° ′	m s
2 33	18 13 W.	14 30 N.	18 8 W.	14 11 N.	18 2 W.	13 52 N.	1 43
2 38	16 24	15 36	16 19	15 18	16 14	15 0	1 38
2 43	14 28	16 49	14 23	16 32	14 18	16 14	1 33
2 48	12 21	18 10	12 17	17 53	12 13	17 35	1 27
2 53	10 1	19 40	9 58	19 23	9 54	19 6	1 20
2 58	7 23	21 21	7 21	21 5	7 18	20 49	1 13
3 3	4 18	23 19	4 17	23 3	4 16	22 47	1 5
3 8	0 32 W.	25 40	0 33 W.	25 25	0 33 W.	25 10	0 56
3 10	1 17 E.	26 45	1 15 E.	26 31	1 14 E.	26 16	0 52
3 12	3 22	27 59	3 19	27 45	3 17	27 32	0 48
3 14	5 50	29 25	5 47	29 12	5 44	28 58	0 43
3 15	7 18	30 15	7 14	30 1	7 10	29 48	0 40
3 16	9 0	31 10	8 54	30 57	8 48	30 44	0 37
3 17	11 2	32 16	10 53	32 2	10 46	31 49	0 34
3 18	13 42 E.	33 39 N.	13 29 E.	33 24 N.	13 17 E.	33 9 N.	0 31

Nautical Almanac Office,
1861, *Nov.* 2.

Observations of the Solar Spots. By Rev. F. Howlett.

Mr. Howlett presented to the Society a further series of drawings of solar spots. The following is extracted from the letter, dated St. Augustine's Parsonage, Hurst Green, Sussex, Nov. 5th, 1861, which accompanied the drawings:—

"The present series, continued from Nov. 15th, 1860, and brought down to Oct. 31st of the present year, consists of about seventy-three drawings of the whole solar disk, as magnified about 30 diameters, besides upwards of 200 separate spots, grouped or single, as amplified from 120 to 150 diameters.

"I may be permitted to remark that the wonderful commotions exhibited on the solar surface during the years 1859 and 1860 have scarcely, I think, been equalled at any period during the year which is now drawing to a close. These commotions,

1861MNRAS..22R...6H

indeed, would appear to be now calming down—consistently, so far, with the much-discussed eleven-year cycle of maximum and minimum of spots.

"At no time, however, this year have I ever observed the Sun to be entirely devoid of spots: the two barest days might, I think, be stated as the 1st Feb. and 9th Oct. last, as may be inferred from the condition of the disks when respectively depicted on the 2d Feb. and 10th Oct. (as shown in sheets Nos. 37 and 58); whilst the spots of the latter part of March, and of the last half also of April and May, were very grand (as see sheets Nos. 41, 43, 44, and 47, especially the last).

"The preponderance of spots occurred, as usual, in the Sun's northern hemisphere; indeed, during the ninety-nine days upon which I made records of these appearances, I found, as nearly as I could judge, that a northern preponderance obtained on 47 days, and a southern one on 28; the spots on the remaining 24 days of recorded observation being nearly equally distributed in both hemispheres.

"The longest series that I have been able to depict of the changes undergone by any one individual spot is that exhibited in nine separate drawings of the spot ν (see sheets 43 and 44), between the period of its first being observed by me on the 16th April and the condition it was in on April 26th, including the alteration suffered even between the hour of 7·30 A.M. and 3·0 P.M. on April 17th.

"A peculiar eddy seems to have strongly characterised the spot numbered 2, in group χ (sheet 54), as observed at 6·20 A.M. on July 29th, but which had nearly ceased, judging from appearances, at 2·15 P.M. on the same day.

"I may also, perhaps, be allowed to call attention to the manner in which I have endeavoured to represent, approximately, the inclination to the horizon, at different hours of the day, of the line of junction of two spots on the Sun's surface, as recorded also on July 29th. The subject is interesting, as far as the matter of spherical geometry is concerned; and not less so, perhaps, as regards the best time for drawing the solar disk —in the way, at least, with which I am obliged at present to content myself, as alluded to in my last communication to the Society.

"The absence of penumbra on the north-east side of so large a spot as β (see Aug. 19th, sheet 56) is, I should imagine, very unusual.

"I would only desire to remark, further, the impression which is increasingly felt by me of the extreme *shallowness*, by comparison, of the photospheric stratum in which is sunk the penumbra of spots generally, and even of the penumbral stratum itself; inasmuch as the nuclei commonly remain visible to almost the very edge of the disk, the penumbral border of a spot very seldom presenting much appearance of foreshortening, either; so far, at least, as I could perceive, though armed with

1861MNRAS..22....8B

a Dawes's solar eye-piece, by Dollond, with a magnifying power of 200 diameters, and with an ordinary astronomical eye-piece, of about 300 diameters, appertaining to one of the Society's Sheepshanks Equatoreals, by Simms.

"This assumed shallowness of the *photosphere*, indeed, seems *proved* by Mr. Nasmyth's most interesting discovery of the thin layer of luminous lenticular bodies, of which that observer asserts the solar surface to consist.

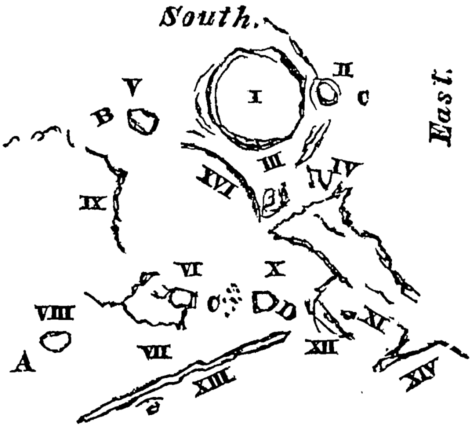
"On the other hand, the *nuclear stratum*, or perhaps *strata*, appears to be of prodigious thickness, as may be inferred from the evidently vast depths into which the nuclear orifices descend, and as the varying intensity of blackness in different parts of the same nucleus seems also to bespeak. See series of large spot ζ throughout sheet 41, and series also of the grand spot ν in sheets 47 and 48, where the idea seems forced upon one, of chasms descending through cloudy strata, dozens or perhaps rather scores of thousands of miles in perpendicular depth."

Description of a portion of the Lunar Surface seen at Dr. Lee's Observatory at Hartwell, on the morning of July 31, 1861.

By W. R. Birt, Esq.

The Roman numerals refer to the accompanying sketch which is taken from Beer and Mädler's map of the Lunar Surface.

I. *Cichus.*—A deep crater on the south-west extremity of a very rugged portion of high land, forming part of the south-east boundary of the *Mare Nubium.*



Mr. Webb thus speaks of *Cichus* :—

"*Cichus,* 189, on index map, a crater opened in table land, lies 9000 feet beneath the plateau, 4000 feet below the plain; its ring is perforated by a smaller crater, an object of